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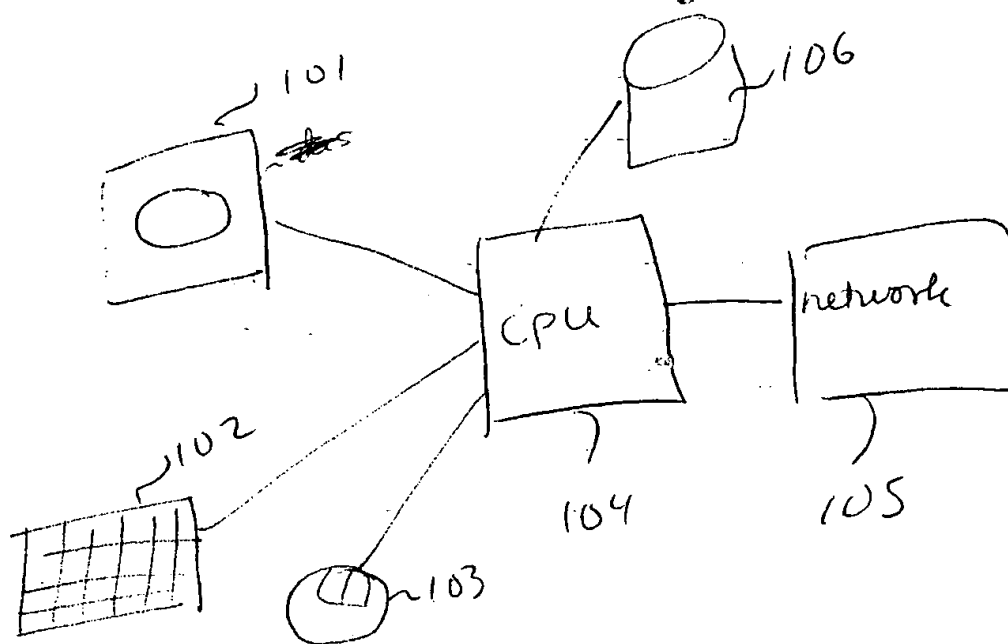
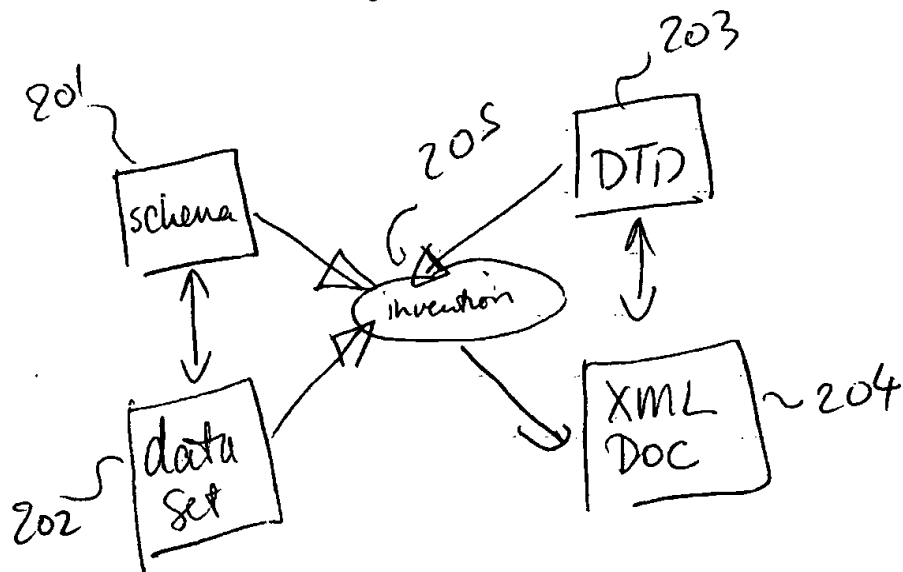


Fig. 1

Fig. 2



09466627-121759

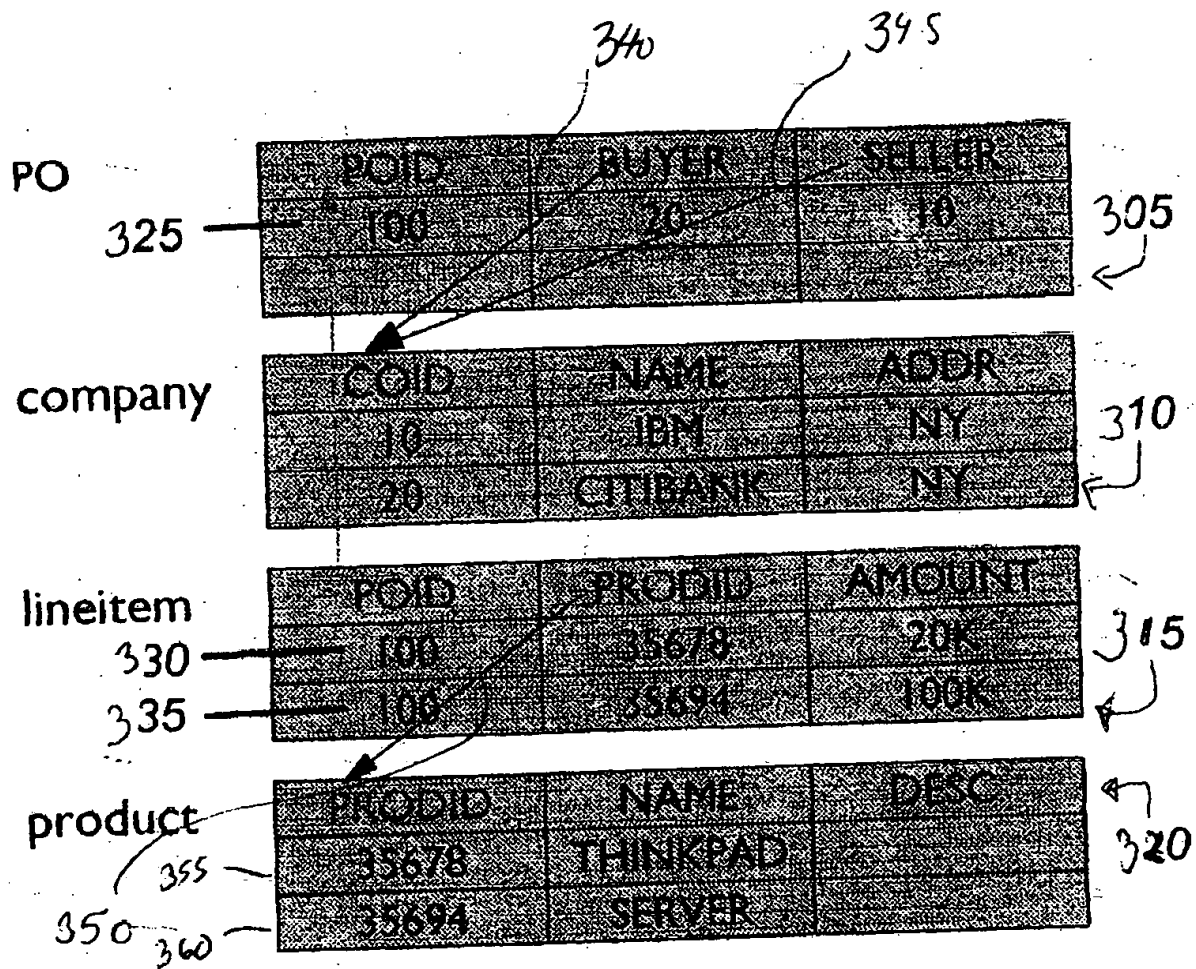


Figure 3a Example purchase order relational schema

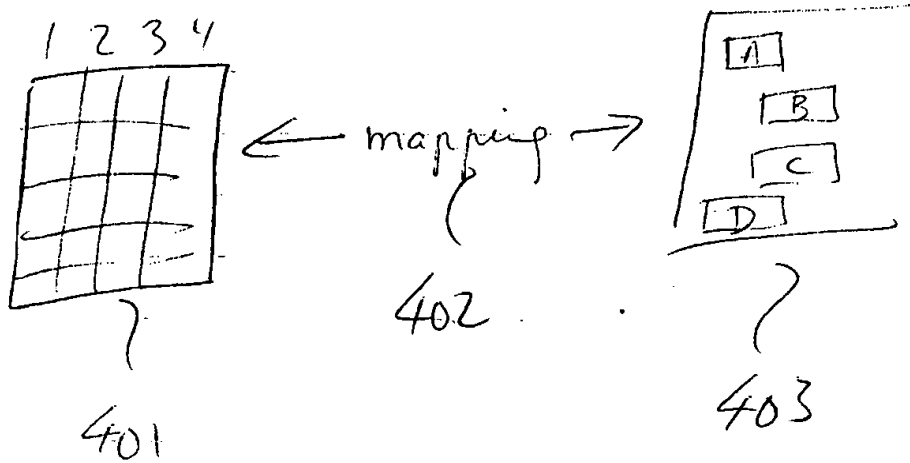
00456627-121799

301 ~<!DOCTYPE PO [
 302 ~<!ELEMENT PO (id, buyer, seller, (lineitem)*)>
 323 303 ~<!ELEMENT id (#PCDATA)>
 ~<!ELEMENT buyer (address)>
 ~<!ATTLIST buyer
 name CDATA #REQUIRED >
 324 304 ~<!ELEMENT seller (address)>
 ~<!ATTLIST seller
 name CDATA #REQUIRED >
 311 ~<!ELEMENT address (#PCDATA)>
 307 ~<!ELEMENT lineitem (prodname, amount)>
 308 ~<!ELEMENT prodname (#PCDATA)>
 310 ~<!ELEMENT amount (#PCDATA)>
]>

Figure 3b. Example DTD

004622129

Fig. 4



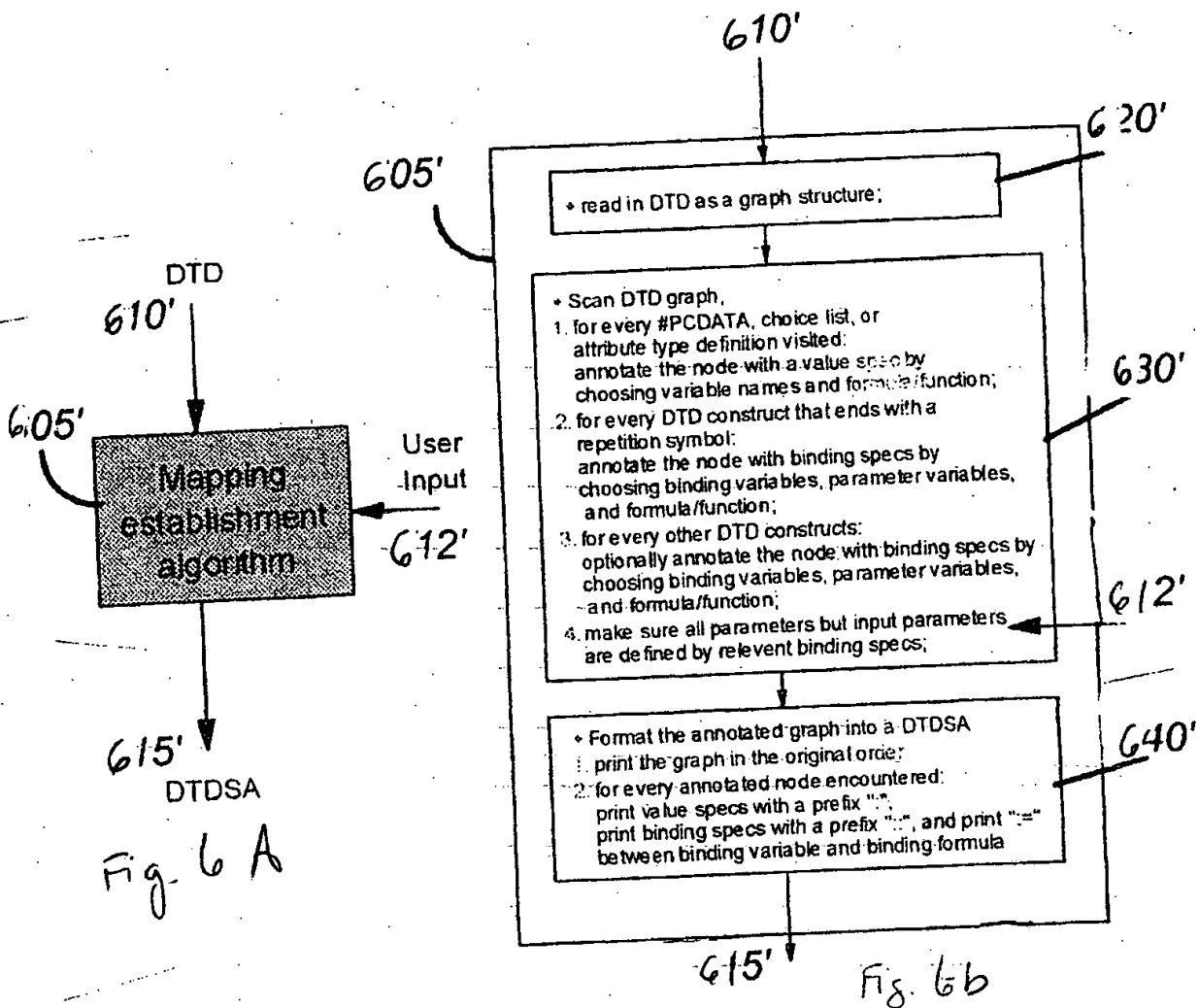
```

<!DOCTYPE PO [
  <!ELEMENT PO (id, buyer, seller,
    (lineitem)* :: w:= row(lineitem, poid, PO.poid(r)) )>
    5 00 / 5 05
    :: r:=row(PO, poid, x) 5 10
  <!ELEMENT id (#PCDATA :PO.poid(r))> 5 15
  <!ELEMENT buyer (address)> :: s:= row(company, id, PO.buyer(r)) 5 35
  <!ATTLIST buyer
    name CDATA #REQUIRED :company.name(s) > 5 20
  <!ELEMENT seller (address)> :: s:= row(company, id, PO.seller(r)) 5 40
  <!ATTLIST seller
    name CDATA #REQUIRED :company.name(s) >
  <!ELEMENT address (#PCDATA :company.address(s))>
  <!ELEMENT lineitem ( prodname,
    amount)> :: v:= row( prod, prodid, lineitem.prodid(w)) 5 45
  <!ELEMENT prodname (#PCDATA :product.prodname(v))> 5 25
  <!ELEMENT amount (#PCDATA :lineitem.amount(w))>
]>

```

Figure 5 Example DTD SA

09466627-12199



Algorithm for establishing the mapping in DTDSA format

00466227 14790 662727 2999460

input parameter
pairs

(A=1;B=100) DTDSA

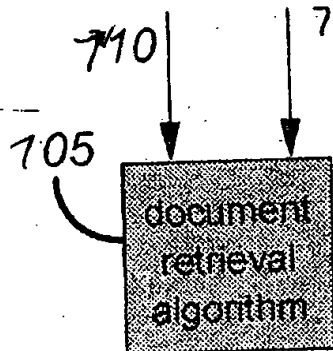


Fig. 7a

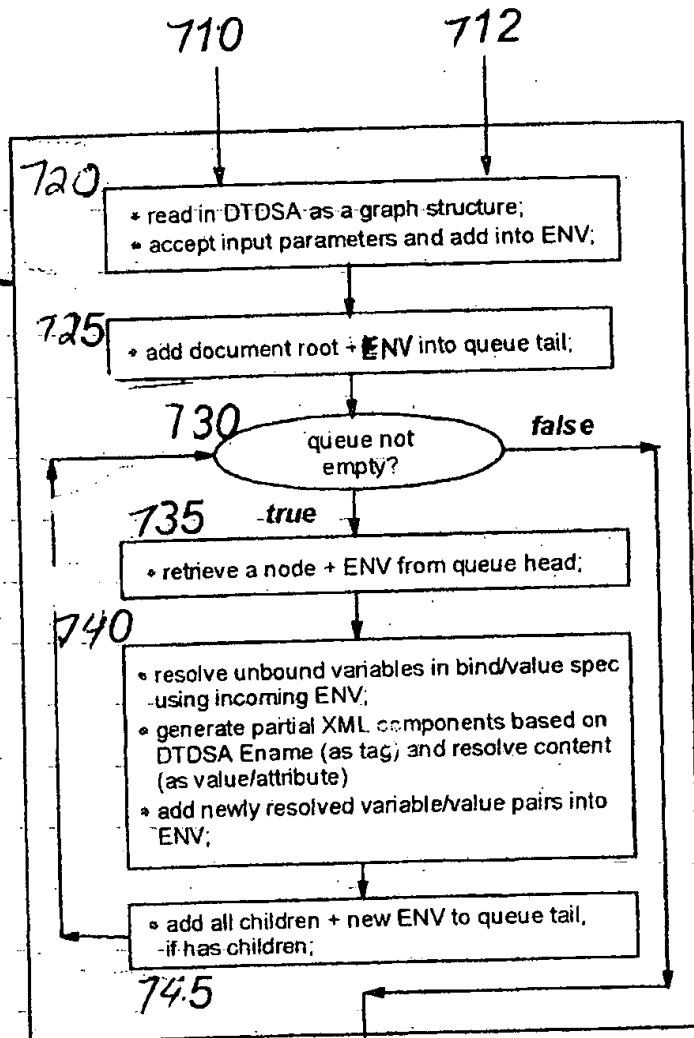


Fig 7b

Algorithm for generating XML using DTDSA

0046627 13799

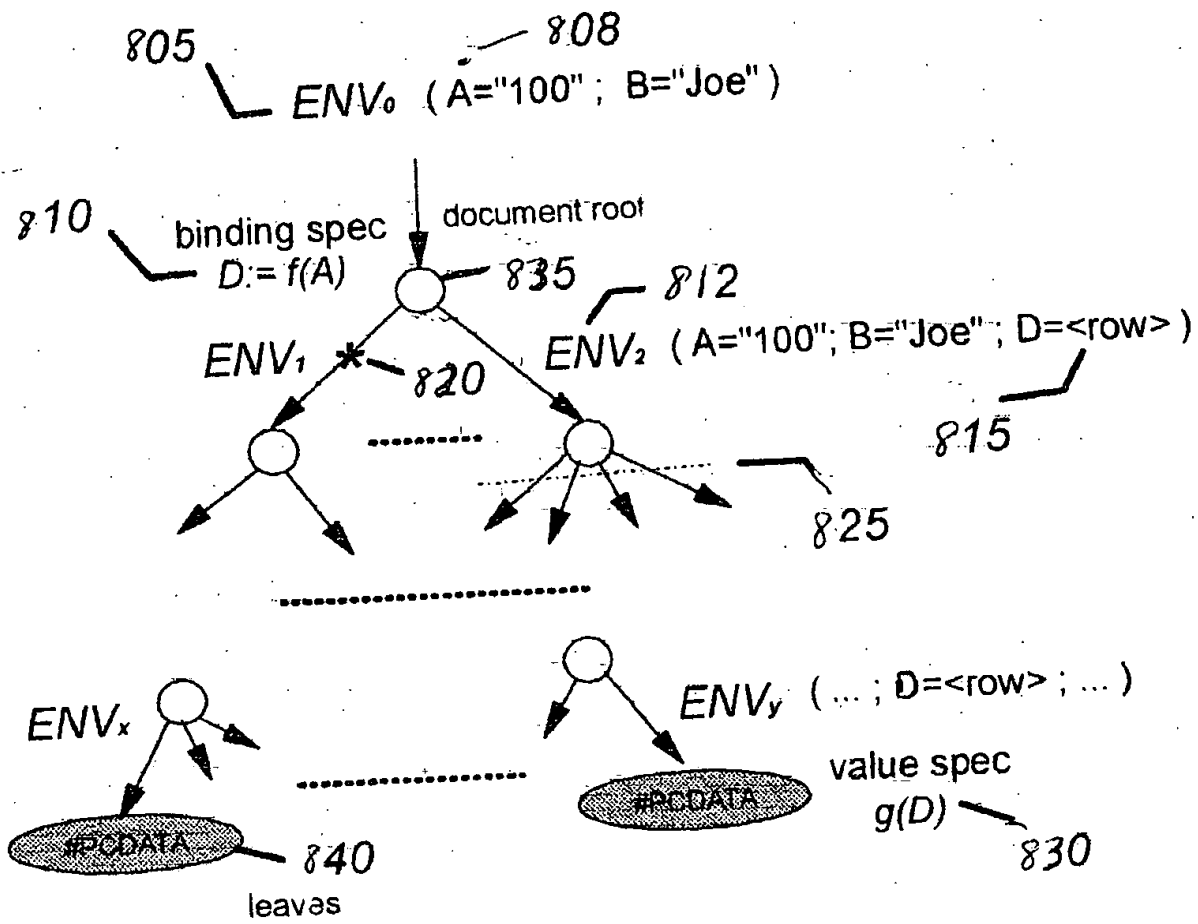


Figure 8 XML composition data flow

900 $x=100$

910 $r:=\text{row}(\text{PO}, \text{poid}, x=100)=\langle 100, 20, 10 \rangle$

905 $w:=\text{row}(\text{lineitem}, \text{poid}, 100)=$
 $\langle \langle 100, 35768, 20K \rangle, \langle 100, 35694, 100K \rangle \rangle$

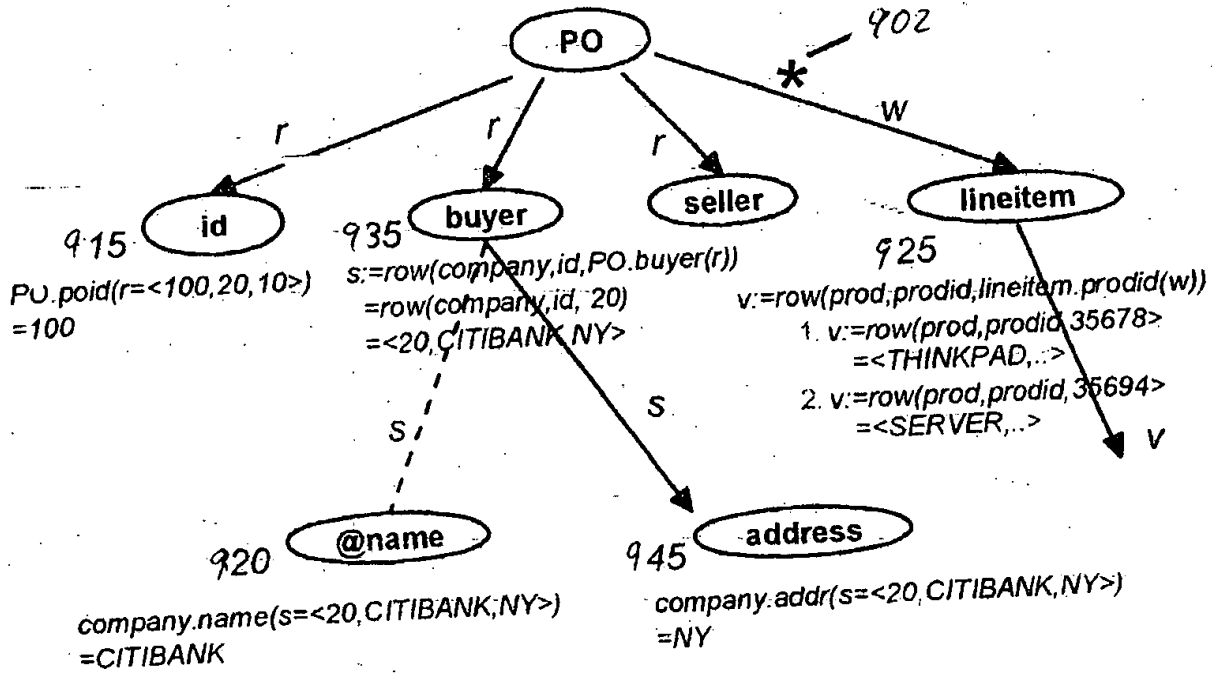


Figure 9 XML composition example with input $x=100$

```

<PO>
  <id> 100 </id>
  <buyer name="CITIBANK">
    <address> NY </address>
  </buyer>
  <seller name="IBM">
    <address> NY </address>
  </seller>
  <lineitem>
    <prodname> THINKPAD </prodname>
    <amount> 20K </amount>
  </lineitem>
  <lineitem>
    <prodname> SERVER </prodname>
    <amount> 100K </amount>
  </lineitem>
</PO>

```

Figure 10 Retrieved XML document (with input x=100)